

# Oracle SQL\*plus

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# Overview

- ◆ SQL: Structured Query Language, pronounced S. Q. L. or sequel.
- ◆ A standard language for relational, object-relational databases: SQL-86 by ANSI, SQL1 by ISO (87), SQL-89, SQL2 (92), SQL-1999. Web site: [www.ansi.org](http://www.ansi.org)
- ◆ Implemented by all commercial R/OR DBMSs: Oracle, Sybase, Ingres, Informix, DB2, SQL Server, ... (with various degree of conformity)
- ◆ We focus on SQL2 & SQL-1999 features and also Oracle SQL.

# Components of SQL

- ◆ Have statements for
  - ▲ Schema definition & update
    - ✦ tables, indexes, views, ...
  - ▲ Data Manipulation
    - ✦ query, insertion, deletion, update, ...
  - ▲ Data integrity
    - ✦ constraints, ...
  - ▲ System administration
    - ✦ users, data security, performance tuning, ...
  - ▲ Application development
    - ✦ procedures, transaction, embedded SQL, ...
  - ▲ ...

# SQL: A Simple Example

- ◆ Create a Students table  
create table Students (  
SSN char(9) not null,  
Name varchar2(20),  
GPA number(3,2),  
Age number(2),  
primary key (SSN));
- ◆ Insert a Student tuple  
insert into Students  
values (312334455, 'John Smith', 3.25, 29);

# SQL: A Simple Example (cont.)

- ◆ Retrieve names of students whose GPA is higher than 3.0 and Age is less than 30.

```
select Name
```

```
from Students
```

```
where GPA > 3.0 and Age < 30;
```

- What data types are supported?
- What constraints can be expressed? How?
- What if I want to change the schema?
- How to change data?
- How to express more complex queries?

# Outline

- ◆ Oracle SQL interface: sqlplus
  - ◆ SQL DDL
  - ◆ Interactive SQL queries, update, view
  - ◆ PL/SQL for procedures, constraints, triggers
  - ◆ Embedded SQL (Oracle Pro\*C/C++, JDBC)
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- Oracle SQL ≠ Standard SQL
  - Oracle manual: Oracle SQL Reference Manual (on-line).

# Oracle DBMS

- ◆ A major commercial DBMS from Oracle (Object-Relational), supporting SQL.
- ◆ Components: Oracle server, SQL\*Plus, Precompilers (Pro\*C/C++, ...), JDBC driver, SQLJ, WebDB, Forms, Report, ...
- ◆ Platforms: Client-server, PC, Unix or Windows, Distributed, Parallel, ...
- ◆ Multiuser, Security, Transactions, Recovery,
- ◆ We use it for course project and homework assignments.

# Oracle DB User Account

- ◆ Needed for every DB user. Has separate user id & password.
- ◆ Access through CSLan UNIX accounts.
- ◆ Environment variables for Oracle access:
  - ▲ Oracle\_BASE, Oracle\_HOME, PATH, LD\_PATH, CLASS\_PATH, ...
- ◆ On-line Instructions for using Oracle.
  - ▲ "Using Oracle in CSLab" on course web page.
  - ▲ On-line Oracle manuals (URL is given in the previous article).



# Oracle SQL\*Plus

- ◆ Interactive user environment.
  - ▲ Runs SQL statements, PL/SQL statements, and other SQL\*Plus commands
  - ▲ Allow simple command editing
- ◆ Documentation:
  - ▲ On-line "help" command within sqlplus
  - ▲ On-line manual.
- ◆ User login: `Unix$sqlplus userid/pwd@cs`  
`SQL> exit`

# Use SQL\*Plus to Run SQL

- ◆ SQL\*plus understands only Oracle SQL.
- ◆ An SQL statement must end with *semicolon ;* a *slash / on a line by itself*, or a *blank line*.
- ◆ An SQL statement can be typed in, or loaded from a .sql file (*get* filename).
- ◆ An SQL can be executed from the command buffer (*run*), or from a .sql file (*@filename*)
- ◆ SQL statement in buffer can be written to a .sql file (*save* filename)

# Common SQL\*Plus Commands

- ◆ Display schema: *describe* table\_name
- ◆ Run Unix commands: *!*command
- ◆ Run editor on .sql file: *edit* filename
  - ▲ Set host editor: *define\_editor=vi*
- ◆ Save a journal file: *spool* filename  
*spool off*
- ◆ Customize environment: *set* option
  - ▲ Options: echo on, pause on, pagesize 30, ...
  - ▲ View current settings: *show all*
  - ▲ Configuration file: *login.sql*

# SQL\*Plus Command Editing

- ◆ Show command in buffer: *list*
- ◆ A set of simple line editing commands.
- ◆ Better use external editor, say, vi or emacs.